

ABSTRACT

A new and useful load-limiting device for a vehicle occupant restraint is provided. The load-limiting device comprises a mechanical structure designed to dissipate forces applied by a vehicle occupant to the load-limiting device during a crash, to absorb energy applied to a vehicle occupant during a crash. Moreover, the design of the load-limiting device of the present invention provides significant flexibility in designing the predetermined manner in which the load-limiting device dissipates forces during a crash, thereby providing flexibility in how energy of a vehicle occupant is absorbed during a crash. In its basic form, the load limiting device comprises a housing and a deformable member, at least one of which is configured for connection to a vehicle safety belt and the other of which is configured for connection to an anchor point (e.g. a structural part of a vehicle). The housing and the deformable member are moveable relative to each other in a predetermined manner when force is applied to the one of those members, and the housing supports a hardened member formed of a material which is harder than the deformable member and which is positioned to engage and deform the deformable member as the deformable member is being moved relative to the housing. The configuration of the deformable member can be designed so that the deformable member will deform in a predetermined manner under forces applied to the load-limiting device by a vehicle occupant during a crash.